

VISIT...

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CLEAN AND DRY

Once you've identified your apparatus, you may find you have to clean it.

1. Wash your glassware at the *end* of the lab day. That way you'll have clean and dry glassware, ready to go for the next lab. This may be difficult to do if you perform an experiment on the day you check in.
2. A *little* solvent, a *little* detergent, and a *lot* of elbow grease. These are the correct proportions for a cleaning solution. You do not need all the soap on the planet, nor do you have to fill the glassware to overflowing with soap solution. *Agitation* is the key here. The more you agitate a small amount of soap solution, the less you agitate your instructor by wasting your time and supplies, and the more effective your cleaning will be.
3. Special Buchner funnel cleaning alert. The standard ceramic Buchner funnel is not transparent, and you can't see whether or not the bums who used the funnel the last time to collect a highly colored product didn't clean the funnel properly. The first time you Buchner filter crystals from an alcohol solution, the colored impurity dissolves, bleeds up into your previously clean crystals and you may have to redo your entire experiment. I'd rinse the Buchner funnel with a bit of hot ethanol before I used it, just for insurance.

DRYING YOUR GLASSWARE WHEN YOU DON'T NEED TO

"It's late. Why haven't you started the experiment yet?"

"I washed all my glassware and spent half an hour drying it."

"What technique are we doing?"

"Steam distillation."

"Steam goes through the entire setup, does it?"

A nodding head responds.

"What's condensed steam?"

"Water...."

There are all sorts of variations, but they boil down to this: You've taken all this time to dry your glassware only to put water in it. Writers of lab manuals are very tricky about this. Perhaps they say you'll be using *steam*. Or maybe 5% aqueous sodium bicarbonate solution. Or even that a byproduct of your reaction is H_2O . Condense *steam* and you get *what*? An aqueous solution has *what* for a solvent? H_2O is *what*?

Look for sources of water other than plain water. If a “water-and” mixture is going to be in the equipment anyway, drying to perfection is silly.

DRYING YOUR GLASSWARE WHEN YOU NEED TO

If you wash your glassware *before* you quit for the day, the next time you need it, it'll be clean and dry. There are only a few reactions you might do that need superclean, superdry apparatus, and you should be given special instructions when that's necessary. (In their book, *Experimental Organic Chemistry*, 2nd edition, McGraw-Hill, 1986, authors H. D. Durst and G. W. Gokel claim that glassware dried overnight is dry enough for the Grignard reaction, an *extremely* moisture-sensitive reaction, and that flame drying can be avoided unless the laboratory atmosphere is extremely humid.)

Don't use the compressed air from the compressed air lines in the lab for drying anything. These systems are full of dirt, oil, and moisture from the pumps, and they will get your equipment dirtier than before you washed it.

Yes, there are a few quick ways of drying glassware in case of emergency. You can rinse *very wet* glassware with a small amount of acetone, *drain the glassware very well*, and put the glassware in a drying oven (about 100°C) for a short spell. The acetone not only washes the water off the glassware very well (the two liquids are **miscible**, that is, they mix in all proportions), but also the liquid left behind is acetone-rich and evaporates faster than water. Don't use this technique unless absolutely necessary.